

Flash Based Alternative Games for Learning Thai as Second Language

by

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Dissertation submitted in partial fulfillment of
the requirements for the
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(Business Information System)

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CERTIFICATION OF APPROVAL

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Approved by,



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UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



YOSSAWADEE KAEOMANEE

ABSTRACT

Learning national language as second language has become an apprehension of a certain group of citizens in Southern part of Thailand. This difficulty, in some way, barricades young children who use Thailand's official language as second language from learning when they enter preschool.

With consideration on this challenge, Flash Based Alternative Games for Learning Thai as Second Language System is proposed to be an alternative solution of the preschool classroom. It comes about to expose the young children to the technology while they learn from the animation lessons and play the interactive games which are the mechanism to teach Thai Language and deliver the educational content.

Besides, the proposed system involves the study of pedagogy using in the Thai preschools and the study of young children nature. As a result, the lessons and games are age-appropriate and match the abilities of the children. Teachers, on the other hand, are able to see the students progress through the score recorded from the game played by the students.

As a consequence the system is not only creating a joyful learning for the children but also help the teachers in analyzing the progress and language development of their students too.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUD OF STUDY

The early childhood period is a vital period for human to develop their cognitive, physical, emotional, and also the social skill. Thus the early childhood education is considered as a foundation of all learning.

From the age of 3, many children entered the preschool school whereby the children start to learn new things and new knowledge from the activities that prepared by the kindergarten teachers according to the approach using in the school.

In Thailand, the kindergarten level is considered as non-formal education services. For most of the public kindergarten school, the child centered approach has been advocated since the beginning of twenty century; however, only few kindergarten teachers in Thailand have practiced learner-centered teaching. Besides many of the school also applied the integrated curriculum concept whereby all the traditional subjects areas occurs primarily through projects and learning centers that teachers plan and that reflect children's interests and suggestions. Teachers guide children's involvement in projects and enrich the learning experience by extending children's ideas, responding to their questions, engaging them in conversation, and challenging their thinking.

Thus the main skill that all children must have before entered the kindergarten school is the communication skill or in other word; children are required to speak in Thai official language in order to proceed with their formal education in school. Otherwise they will face difficulty in learning other subjects and developing other skills.

In addition, in these days there are a lot of studies and researches of the use of games in the kindergarten school in order to support children learning progress. Most of the

games are focus more on the academic skills e.g. Mathematics, Science etc. But there are not many games that focus on developing a strong foundation of Thai language.

1.2 PROBLEM STATEMENT

In different part of Thailand, people speak in different dialects according to the region where they live. Although there are many totally different vocabularies, each dialect still has some similarity to the official language of Thailand which is Thai.

In southern part of Thailand, especially in the boarder provinces i.e. Yala, Pattani, Naratiwat, and some parts of Songkhla and Satun Province, over 80-85 percent of the Melayu residents use Patani Malay language as their first language. From the studies, majority of the residents in these areas with the age above 50 and the young children use only this dialect in their daily communication [1].

This means that all these children have to learn Thai language as their second language. Consequently, most of them will face difficulty in communicating and representing their experiences, feeling and emotion to the teachers and friends when they are in class room. And it could be said that this also affect the performance of the children to be slightly lower than other children who can speak Thai fluently too.

The challenges not only arise in children but also the kindergarten teachers who will face the difficulty in interacting with and understand the children. In teaching language, many teachers spend time in talking with the children, show several pictures and things which the children should know and ask the children to repeat the word they teach again and again. Although this technique seem to be work out but it need longer time and many time it cannot attract children attention.

For example, in Baan Najuak School, Songkhla Province, over 60 percent of new children entered kindergarten each year use the Patani Malay dialect as their first language and do not use or speak Thai in their daily life. The effect of this will be more serious in the second year of kindergarten because children will have slow learning progress for other curriculum too since the teacher will be teach in Thai and the school using the integrated curriculum concept.

1.3 OBJECTIVES

The objectives of this project are show as follow;

1. To develop an interactive system that encourages young children to learn Thai which is corresponded to the integrated curriculum.
2. To integrate the child-centered approach in the web-based games as an alternative for the preschool classroom apart from the traditional games.

1.4 SCOPE OF STUDY

The main objective of this project is to develop a web based game which will be used in the kindergarten as an alternative game to teach language. Since the games will be designed for the kindergarten-age children, thus the first task for this project is to study about the nature of children, the development process, and the ability of the children in this particular age.

However, the game is going to be used in the school together with the teacher's instruction thus equally important the study must cover the approaches using in school as well as the pedagogy and also the curriculum that has been teaching in the kindergarten.

1.5 LIMITATION

The only limitation of the system will be the Internet connection since the system is a web based application. The speed of the internet will determine the downloading time of the games thus to utilize the system the school should have a high speed Internet connection to avoid disruption while children play the games.

1.6 FEASIBILITY STUDIES

1.6.1 Technical Feasibility

The project is moderate technical feasible from the point of the developer view, by taking in to account the familiarity with application and technology, project size and compatibility with the existing way of teaching and learning in kindergarten.

For familiarity with application and technology, both the developer and the users are familiar with the web-based application and also flash application thus the combination of these both should not generate a problem for the users in understanding and using the system.

And discussing about the project size, it is consider quite small from the beginning requirement given and the estimation of the developer.

Lastly, the compatibility with the kindergarten, both the developer and the kindergarten teacher agreed that the system will be compatible with the existing activities based learning concept of the school.

1.6.2 Economic Feasibility

This system is first aimed to be the alternative games for the kindergarten teacher to be use in school. During the development process, there is no cost occurred. Just to mention about the maintenance where by the system is a web based application thus the only cost will be the sever fee for the website. As a result, the project is economic feasible.

1.6.3 Organizational Feasibility

As in every kindergarten school, the use of the games in learning and teaching process exist and the children are always eager to learn new thing especially about technology. From the perspective of the kindergarten teacher the system is organizational feasible.

CHAPTER 2

LITERATURE REVIEW

2.1 EARLY CHILDHOOD, LEARNING AND PLAY

Early childhood is the one of the important stage of one's life. In general it's used to call the children range from age two to six years old. The physical development of the early children is obviously seen. Their body will become leaner and longer. They will become more self-sufficient and also know more to control themselves. Apart from the physical development, the psychological development also gained through their make-believe play. The language and thought expand quickly thus they start to have more conversation and develop ties with others [2].

The children in this range of ages start to develop all the major domains of development i.e. physical development, cognitive development, emotional and social development concurrently.

It is commonly accepted that the early childhood is the period that children have rapid growth in every aspect. The children in this age will learn from the surrounding environment i.e. family, teachers, preschool peers and also other things they see. What we can say is they are a "natural learners" [3]. One may learn in a different way from others which maybe depends on their learning style. Every child has a particular learning personality which is distinctively different from one to other. They start learning by using all their senses but at the end something will become more natural then others and can suit them the most [4].

Some children may learn well when they see things (Visualization Style), some may like to listen and speak (Auditory Style) and others may like to learn by doing (Kinaesthetic Style). Apart from the group in these three learning styles, children may like to solve problems and calculation (Logical-mathematical Style), some may like

imagination or think intuitively (intuitive Style), some may learn best alone (Solitary Style) and some others in group (Social Style).

From observing the children, parents and teachers can determine what style is appropriate for the children and as a consequence the activities can be chosen for the children to enhance their learning ability as support by the studies of many researchers in the California Journal of Science Education. Their study found that when the teaching match children learning styles, and some of their characteristics, the children tend to have higher achievement [5].

Regardless of what learning style the children have, there is one common nature among all children is that they like to play because play is a natural part of the behavior of all children. It has been described in many cultures and in many periods of history, documenting its universality [6]. The early childhood educators know how important play is in children's lives. It is not only a spontaneous or enjoyable activity but actually it also helps in the process of children's psychological development. Children will start to play when they want to and have their own rule in playing [7].

In playing, a child might play on his/her own, play in group, and play with dolls or toys. The play of children at two years old differs significantly from the six years old; meaning that the play of children grows together with them, it will become more complex and integrative as children grow and gain experiences.

In *All Work No Play* from one of the authors describes his experiences involving in the kindergarten for more than 30 years that "the children who were the most active players in the preschool were also the most active learners in elementary school". There are a lot of evidences he used to support the vital role of play in early childhood education in his study, the following are for illustration [8];

A study conducted in the 1970s in Germany, at a time when many preschools were being transformed into academic rather than play-oriented environments, bears out the relationship between preschool play and elementary school success.

The study compared 50 play-oriented preschools with 50 academically oriented ones. The children were followed until fourth grade, at which point the children from the play-oriented preschools

excelled over the others in every area measured – physical, emotional, social, and intellectual development. The results were especially striking among lower-income children, who clearly benefited from the play-oriented approach. The overall results were so compelling that Germany switched all its preschools back to being play-oriented.

A recent study by Rebecca Marcon of the University of North Florida found similar results when children from different pre-school programs were followed through fourth grade. Those who had attended play-oriented programs where child-initiated activities predominated did better academically than those who had attended academic-oriented programs.

Attention span of children varies with age, gender and also type of activities they participate. In general, children's attention span develops two minutes per year as children grow. Thus 3-year-old children will have at least six minutes attention for any activities they participate. However they will be able to maintain a longer attention and concentration on the activities that match their interests and abilities.

2.2 COMPUTER/ ONLINE GAMES AND CHILDREN

We cannot deny that computer has become part of our lives. The children also start discovering the computer at a very young age nowadays. Most of the parents are also excited to see their children exploring the technology which they can learn and enjoy in the same time [9].

Recently, children have become one another target of the software providers. There are increasing numbers of educational computer software and online games are available for this target group. It is developed in a playful manner so that appear more attractive to children [10]. With this the learning content is conveyed in an enjoyable way to children. However, this kind of software will generate a full advantage to children only when the educational content is well integrated into the structure of it [11].

With games children can learn while they are playing. They also will have a longer attention towards it because it is something they enjoy. There are many study support that the computer and online games can have a good effect to children's attention and

memory capacity, one of that was “Children get smarter with their computer games: shooting baddies can help the development of academic skills” which being cited and mention in many other researches. In his study, found that computer games can be useful in enhancing memory capacity, in concentration of attention and in the problem solving strategies of young children, which can indirectly affect their academic achievement [12].

However, the issue about the use of computer games and online games to encourage children learning is still debatable. Even there are a lot of studies and researches show the advantages though many educators still oppose it.

There are plenty of games for children available online and off-line. Unfortunately there are not many websites aim specifically for the preschool level compare to those for children at older ages. One another interesting study found that some computer and online games available nowadays are produced without having carefully concern of the pedagogical theories nor any theoretical foundation. Many of them are developed just attract children by using animations, bright colors, sound and some surprises.

From the author’s study regarding the online games, the existing site for games are mostly targeted the school-level children. Further more most of those sites are developing for selling purpose.

2.2.1 Review of online games for young children

These days there are a lot of websites for early children available. In order to develop one another, it is important for the developer to study the existing those websites. This section aimed to study the existing website for similar target group which is the young children age three to five years old. However, since the similar website in Thai is hardly to find, the developer thus conduct this study on the English-based website instead.

2.2.1.1 ABCya! Preschool

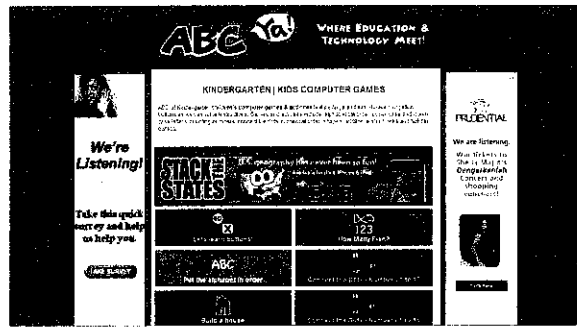


Figure 2.1: ABCya! Homepage

Description from the site: “ABCya! Preschool children's computer games & activities feature large and easy-to-use navigation buttons as well as voice instructions. Games and activities include: alphabetical order, upper-case and lower-case letters, counting numbers, connect the dots, numerical order, shapes, addition, e-storybooks and holiday games.”

The ABCya! Websites is actually target children range from preschool to fifth grade. Each grade has different games or slightly different games, the older grade will have more games and higher level of difficulty.

The examples of the games for preschool are connecting dots, ordering alphabets, make a snow man, build a house, puzzles, paint and create, shapes and etc. Apart from the games, there are voice instructions to guide children how to play the games as an additional feature to suite the ability of children which many of them may not be able to read yet.

2.2.1.2 UpToTen.com

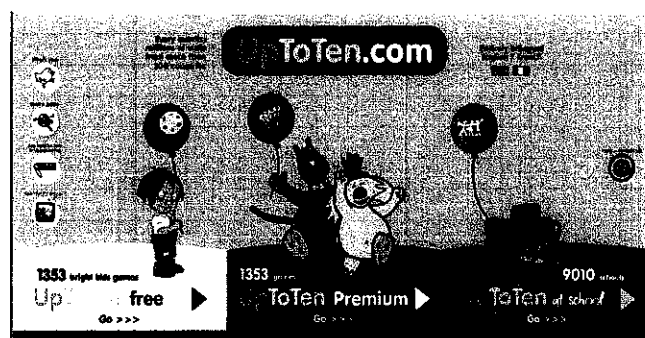


Figure 2.2: UpToTen Homepage

Description from the site: “UpToTen has been building prize-winning early-learning games and activities since 1999. The children will love the reassuring, friendly world that our unique games inhabit. S/he will have enormous fun whilst building independence on the computer. UpToTen.com is completely independent and is still owned and run by the company's founders. We do all the illustrations, animations, design, music and dialogues ourselves, and lovingly bring them together to make positively reinforcing games in a warm and welcoming play-area.”

UpTpTen has both free and commercial games and software so that make the free games available in limited numbers and not variety. However one most attractive part of this website is they provide a lot of songs and animations.

2.2.1.3 LittlePim.com

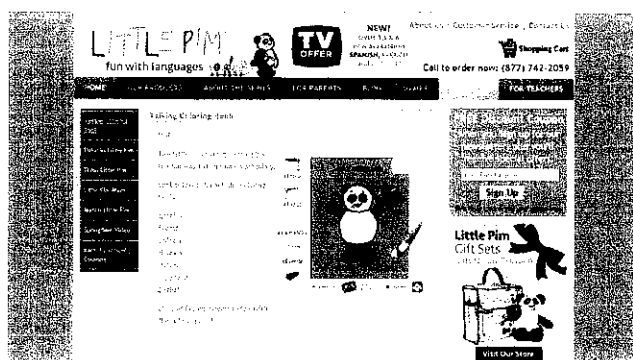


Figure 2.3: Little Pim Homepage

Description from the site: “Little Pim was created in 2006 by Julia Pimsleur Levine, a mom who grew up bilingual and was looking for fun ways to introduce her young son to the French language. Pimsleur Levine created a series that delights kids as much as any purely entertainment show, and treats play and learning as seamless activities. The Little Pim DVDs and products all make language learning fun and easy for babies, toddlers, preschoolers, and their monolingual or bilingual parents. Little Pim is the most comprehensive series available today for introducing a foreign language to young children between the ages of zero and five.”

Little Pim is another software and games commercial website. Its main purpose is slightly different from the first two selected website because it aims to be a website that teaching foreign language. Thus the games for illustration, painting, are introduced in many choices of language.

2.2.1.4 Dekgeng.com

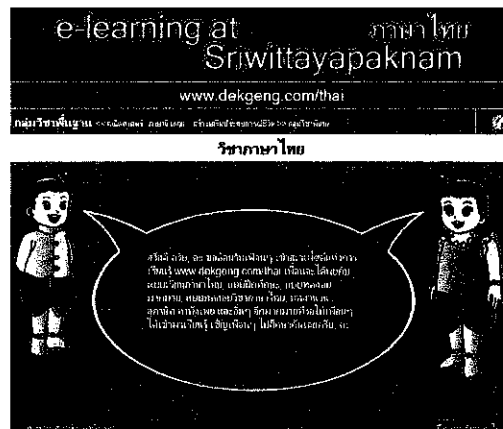


Figure 2.4: E-learning by Dekgeng.Com

Description from the site: Dekgeng.com is an education website that developed for the purpose of teaching the basic curriculums in school i.e. Mathematics, Science, English, and Thai. The website contains the lessons, exercises and games according to the lessons. Its target groups are the school-level children.

Focus particularly on Thai language, this e-learning teaches how to read and write each alphabet for the children who has no reading and writing skills hereby preschool teacher can use the website. However, the appearance of the website is not attractive enough in another word it is quite formal learning rather than a fun games for kids.

2.2.2 Flash-based Learning Approach

Interactivity is one important elements in learning that can draw learners attention toward what they are being taught. It is hardly achieve through the use of normal text or exercise books since the books cannot have two-way communication with the learners.

Flash application has been well known among the educational software and game developer as it excels in many elements that can be used to develop interactive software which can best engage the students towards learning.

Research indicates that people are able to memorize 20 percent of the content that they see, increase to 40 percent if they see and hear but if they can see, hear and do simultaneously the amount of content that people are capable to memorize increases

up to 75 percent [13]. This research also supported by another study which reveals that the students can gain better academic achievement when they learn from visual and auditory information compare to those receiving only pictures and text from the normal text books [14,15].

From all the premises above, flash software then become a first choice for computer-based educational game developers as it excels in all the aspects needed to produce animation, multimedia and games [16]. Furthermore by allowing the combination of animation, speech, sound and games in one, the flash lessons and games will be able to reach more and variety learning style of children[17] .

2.3 PRESCHOOL'S APPROACH AND PEDAGOGY

The main objective of Thai preschool is to provide the opportunities for early children to have development in all aspects i.e. physical development, emotional development, social development, and cognitive development that correspondent to their abilities.

This section aims to study on the common syllabus approved by the Ministry of Education which is applied in all public schools through out Thailand.

2.3.1 Child centered approach

From the study about the child-centered approach, the author found that there are a lot of definition and explanation about it. This is one evidence that child centered approach is still one of the dominant approaches using in preschool and schools level.

The child-centered approach is the approach that focuses on the children's cognitive and emotional development. It has an environment that encourages children to initiate their own learning which they can choose what to learn according to their preferences. Children in the child center class room will discover their potential by working more independently according to their own learning styles [18]. Further more in such environment, the children needs, and opinions are taken into consideration. The role of teacher in this approach is as a facilitator who guides children and helping them in learning what is best for them [19].

In the past, Thai first teaching style was the teacher-centered approach whereby the teachers are the center of attention. Students only learn to memorize but not thinking. Thus at the end of the day, most of the students end up with lacking the critical thinking skills. As a result, the Ministry of Education decided to reform the system by changing from teacher-centered to child-centered or learner-centered approach. This approach was introduced widely in all of the public and also the private schools.

Minister of Education Government of Thailand has given the definition of child centered as the teaching approach that provides experiences for students and aims to support students' learning, thinking, exploring, working and concluding knowledge. Children will be able to collaborate with others and apply their knowledge and skills. They will learn on their own, the teachers will be the assistance in showing them how to learn, where to learn, where to get information, and how to make use of it. The teaching-learning process in child-centered approach will allow the learners to improve their capabilities to the best of their potential at their own pace.

The comparison of the characteristics of *teacher centered* approach and *learner centered* approach as follow [20].

“Characteristics of teacher-centered teaching and learner-centered teaching are completely different. The characteristics of teacher-centered teaching are: (a) stimulus-response- reward, (b) pigeon training, (c) matching ring cross, and (d) construct meaning. On the other hand, the characteristics of learner-centered teaching are: (a) It is the way that teachers let students learn with their own ways according to their individual differences; (b) students construct their knowledge and improve their skills and attitudes by doing activities that teachers and students create; (c) teachers support students to practice analyzing and make decisions from information that students get; (d) students are active learners, not passive learners, and they enjoy learning; (e) teachers assist students in understanding the meaning of what they learn and relate to daily activities; and (f) students are able to conclude information and their own ideas, and they gain good attitudes towards learning (p.35).”

Naturally the child centered based classroom, children are learning through play. Social development of children rises when they learn and play with their peers. This kind of classroom will have the atmosphere that encourage emotional expression and self-confident. In her opinion, the role of a teacher in child-centered approach is a “facilitator” whereby facilitate and allow the children in the class to exploring things by themselves depending on their potential.

2.3.2 Thai Preschool’s Syllabus

The following syllabus is the common syllabus approved by the Ministry of Education, Thailand. From the conceptual framework indicated by the Institute of Academic Development Thailand (IADTH), the syllabus of the preschool level is as follow.

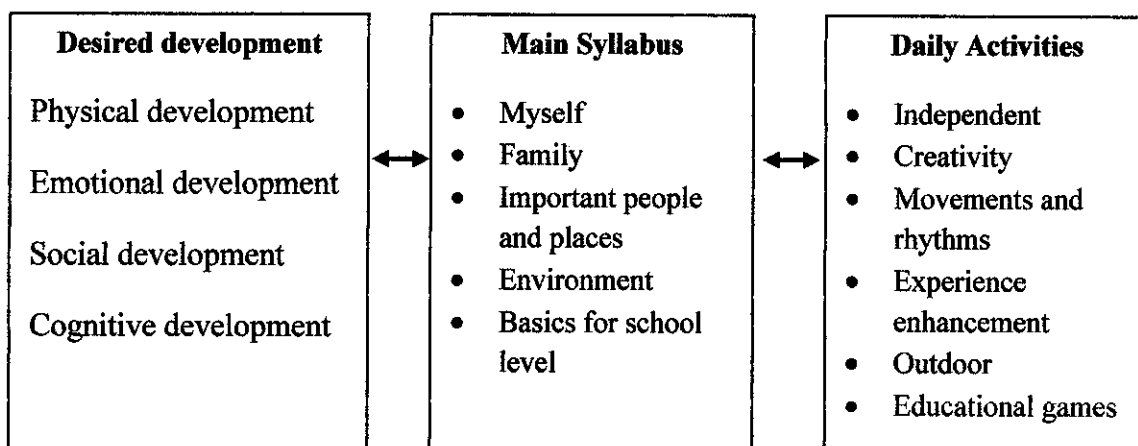


Figure 2.5: Desired development, Main Syllabus and Daily Activities

The diagram shows the relations between the desired developments, the syllabus and the daily activities.

- **Oneself**

Children will learn about the main parts of their body i.e. eyes, nose, mouth, ears, arms, hands, legs, and feet and also learn how to take care of them.

- **Family**

Children will learn how to call the family members and the relationship between them. They will learn their each member duties. Further more they also learn about their house and rooms inside the house.

- **Important People and Places**

The royal family i.e. the King, the Queen and other important person such as the Prime Minister are to be introduced to children. In addition, children will discover the name of the occupations in the society and also their work places. To illustration, the doctor works in the hospital.

- **Environment**

In this topic, the children are going to discover about the environment i.e. plants and animals. They will learn about the local plants and animals. A part from that they will learn about the time and natural phenomena.

- **Basic literacy and numeracy for school level**

The basic skills that children should possess before going to the school level are the ability to read and write the alphabets, numbers, know the shapes, colors and also some comparison words such as inside, outside, big, small etc.

2.3.3 Daily Activities

The daily activities of the preschool level from the curriculum planned by the Ministry of Education of Thailand are summarized as follow [21].

- **Independent activities:** or corner play, which emphasize opportunity to play in each play and experience corners or the education centers have prepared in the classrooms such as corners of block, books, sciences, natural studies, home, shop, and so on freely optimizing children with documents.
- **Creative Activities** to help children express their emotion, sensation, thinking, initiatives and imaginative by suing arts such as painting, casting, tearing, cutting, pasting, screening, sewing, investigating or other methods that they can create to fit their development such as Lego, and jigsaws and so on
- **Movement and Rhythmic activities** to allow children body movement freely and rhythmically with music, rhymes, percussion, and other devices to incorporate with movement enhancing imagination, creativities, learning of rhythms and control self-rhythms.

- **Experience enhancement activities** are focusing on child development of learning skills, apprenticeship and staying together both in small and big groups. They are allowing children to listen, speak, observe, think, solving problems, reasoning and practice to earn concepts what they have learnt through different activities such as conversation, debate, demonstration, experiment, narration, role play, singing, memorizing, educational excursion, guest speakers and so on.
- **Outdoor activities** allow children to leave the classrooms for experiences and physical movements and independent expression based on each interest and capacity. They are playground, sand play, doll home, home model, carpenter corner, sports and games.
- **Educational games** help develop intellectuals, with simple rules and obligations and a child can play alone or in group to help them observing, critical thinking and conceptualizing in relation to stature, number, type, relationship, areas and distance. Some proper educational games for 3-6 year children are pairing, classifying, grouping, consecution, domino, lotto, cut and form, jigsaw and so on.

2.4 LANGUAGE DEVELOPMENT IN YOUNG CHILDREN

With Language the communications among humans become easier. By using language children will have opportunities to learn more because the ability to speak can determine the level of conversation between them the teachers. There is no genetic code that leads a child to speak English or Spanish or Japanese. Language is learned. We are born with the capacity to make 40 sounds and our genetics allows our brain to make associations between sounds and objects, actions, or ideas. The combination of these capabilities allows the creation of language [22].

Learning to read and write is critical to a child's success in school and later in life. One of the best predictors of whether a child will function competently in school and go on to contribute actively in our increasingly literate society is the level to which the child progresses in reading and writing. Although reading and writing abilities continue to develop throughout the life span, the early childhood years, from birth through age eight, are the most important period for literacy development [23].

As mentioned in earlier section that the target audience of the games that are the young children who use Thai as their second language, there is a study proved that the use of computer technology help in developing the language and literacy development by engaging the children with longer and more complex speech [24]. The study mentioned that with the technology of today can encourage the development of fluency since the children who engage with the computers are at the same time engaging in high levels of spoken communication.

3.1 SYSTEM DEVELOPEMTN METHODOLOGY

After considered above factors, the Throwaway Prototyping Methodology is selected for the development of this system.



The developer has engaged with a person who requested the system to conduct a feasibility study and also a simple system pre-test. Furthermore the project plan for the first three phases i.e. planning, analysis and design are also created. For the Gantt chart for the project plan see in Appendix A.

The first task of this phase is for the developer to analyze the requirements of the

users which are the preschool teacher and the children thus there will be an information gathering by both doing research from published papers/journals and also interview and observation sessions.

As a project, one vital task under the analysis phase is gathering the relevant information before designing and developing a right system. Same goes here, the developer need to do a research to answer the following questions;

1. How children develop their skill?
2. How the Language is been taught in preschool school?
3. What how to attract children attention?
4. What are the approaches of learning using in school today?
5. How the usages of game in preschool affect children?

The data were collected to answer the above questions will both primary data and secondary data. For the secondary data, the developer have reviewed the literature from various sources of data including books and other published paper and articles available in the Internet. And to gain more detailed information about the real environment in the preschool, the interview session is conducted with some preschool teachers. Thus from the session, the developer gained more understanding about the requirements of the users which will be teachers and students as discussion in the preliminary study, Chapter 4.

3.1.1.3. Design

Based on the information gathered and the to-be requirement from the analysis phase, the developer then will starts the design phase. This phase of the development need high involvement of the preschool teachers. The deliverables of this phase will be the designed prototype to be use in the implementation phase.

(a) System Architecture

The design of the system architecture for Alternative Learning game is shown in figure 3.2. From the figure, the users i.e. the teachers or preschoolers start the communication with the system by logging in and accessing the flash application through the web-browser. Flash application will then send a request or data to the Database by the assistance of PHP which is a server side scripting language

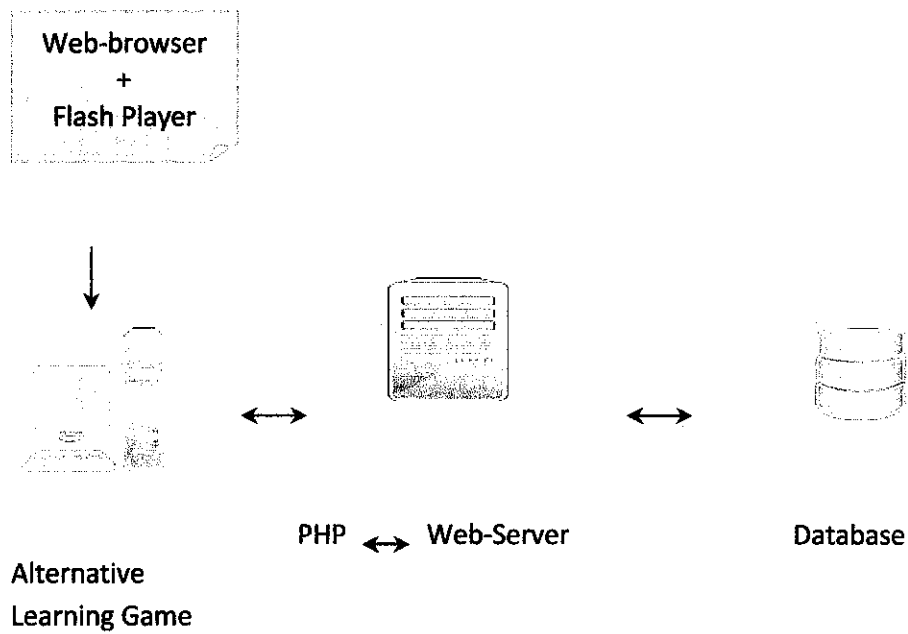


Figure 3.2 System Architecture.

(b) Activity and Use Case Diagram

By reviewing the common syllabus approved by the Thailand Ministry of Education and discussing with experienced preschool teachers and teaching assistants, there are five chosen modules for the development of the alternative learning game shown as follow.

- Thai alphabets
- Numbers
- Colours and shapes recognition
- Myself and my family
- Surrounded Environment

The result from the system requirement and literature review were then translated into the system models by using the Unified Modelling Language (UML) as shown in figure 3.3 and 3.4 in the following pages.

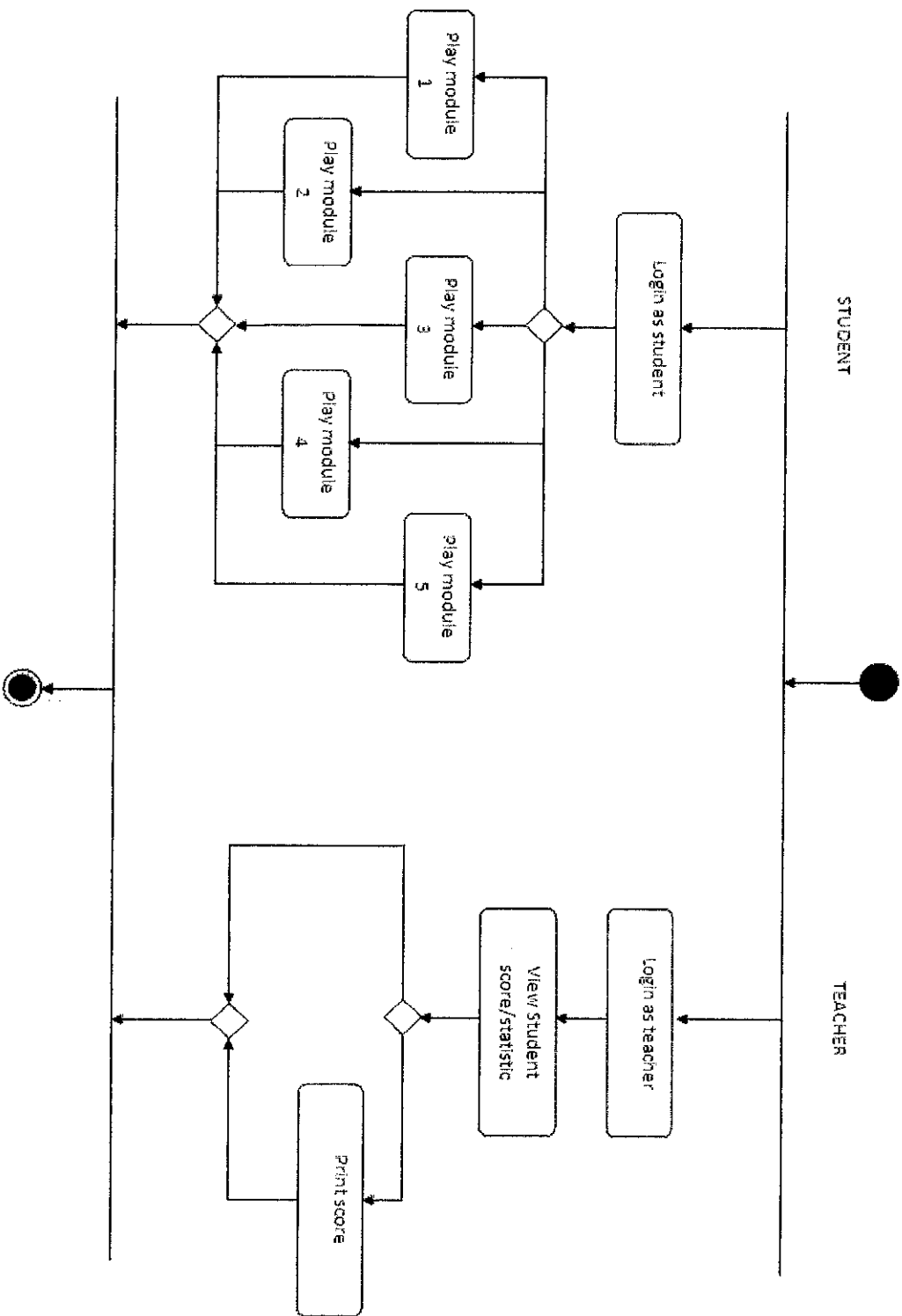


Figure 3.3 Activity Diagram

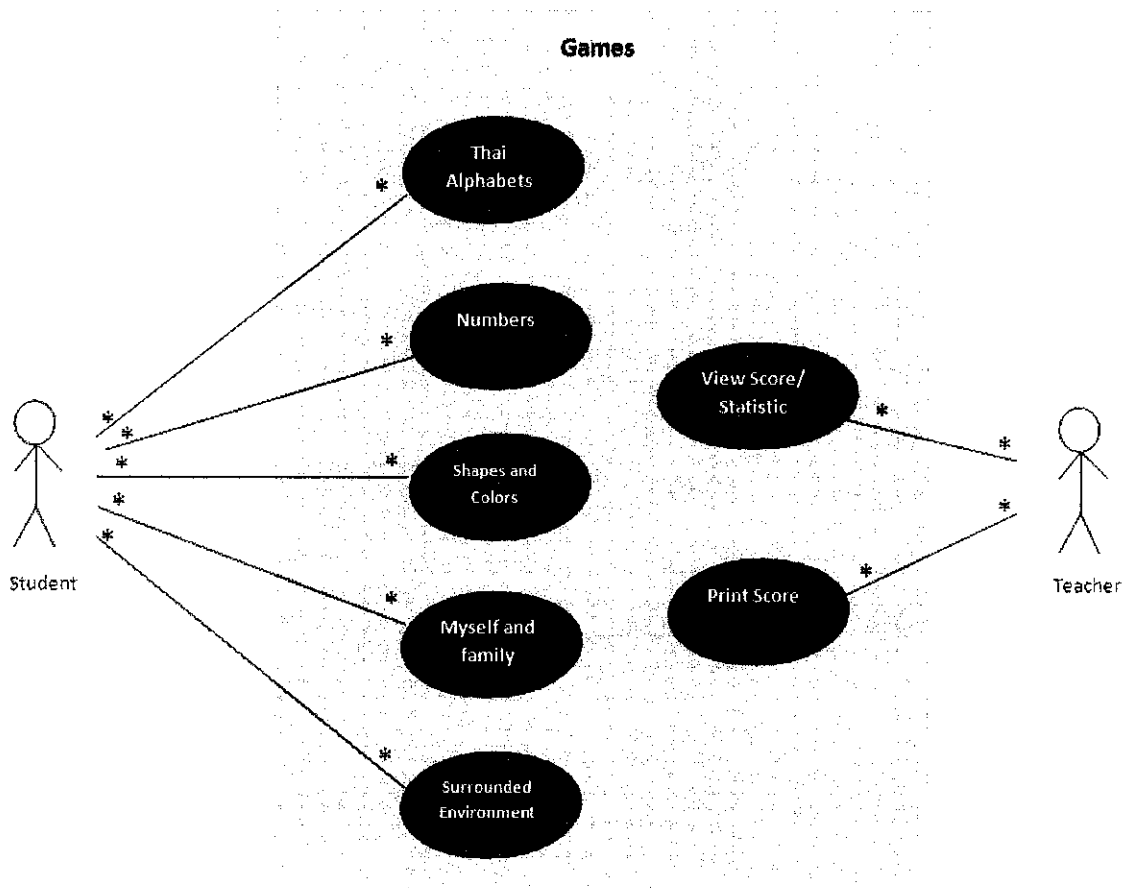


Figure 3.4 Use case Diagram

(c) Lesson and Game design

Keeping in mind that the lesson and games are vital parts of this project therefore during the designing phase, the active participation of the pre-school teachers in order to come up with the following lessons and games designs is required.

In addition to the interface and design of the lessons and game, the mouse activities that will be use by the children to play the game are also important to be taken into consideration. Because most of small children face difficulties with double clicking and dragging, thus in this game those mouse activities are discarded see detailed discussion in Chapter 4.

3.1.1.4. Implementation

A design prototyped will be implemented in this phase and refine again and again based on the clearer requirements and the feedback of the users. Detailed implementation is to be discussed user the result and discussion in Chapter 4.

3.2 TOOLS REQUIREMENT

Tools requirement as for the development of the system are shown below.

3.2.1 Software

- Adobe Dreamweaver CS3
- Adobe Photoshop CS3
- Adobe Flash CS3
- XAMPP Server
- Free Sound Recorder

CHAPTER 4

RESULT AND DISCUSSION

4.1 PRELIMINARY STUDY

4.1.1 Survey and Observation

For the first semester of the final year project, few preliminary studies have been conducted. The objectives of these studies were to understand the problems existing in learning and doing activities in class of the preschool students who cannot speak Thai fluently and understand more about the approach used by the teachers to handle those students. This study found that many of those students were not able to start doing work on their own; they have to follow their friends. Furthermore they also face difficulties in expressing their opinion, feeling and experiences when the class has story telling activities too.

Besides that problem, the preliminary studies also focused on the use of computer in the daily activities of the preschool class room. From the observation, most of the students were excited to learn and use the computer even though the teacher only used it for the Rhythmic activities once a week. See Appendix B for System Pre-Test Survey.

4.1.2 Interview

To be more attentive before designing this web-based game, the developer have conducted second interview based on the system pre-test survey with the preschool teachers about their familiarity with computer and website and also their opinion in implementing the are web-based games to encourage children to learn Thai language.

4.2 SYSTEM PROTOTYPE TESTING

Before developing full system and all the games for each lesson, a prototype of a game is developed to test the psychomotor ability of the preschoolers and also their response towards this kind of educational game. The small experiment is conducted with the preschoolers at the Baan Najuak School, Songkhla province shows in Figure 4.1 below.



Figure 4.1 Small experiment for a prototype testing

The game is tested with 7 students whose backgrounds regarding computer experience are different. Two of the children who has been using the computer for sometime can learn how to play the game especially the use of drag and drop activity faster than those who have lesser experience however this activity is still considered difficult for them since the wrong symbol appeared few times showing that they missed place the answer. Figure 4.2 shows the first prototype of the Alphabet matching game for the Thai Alphabet Module.



Figure 4.2 First prototype of Thai Alphabet Game

This game led to the finding that the drag and drop activity is not suitable for the preschooler children due to their psychomotor abilities are limited. This finding is also supported by the finding of many other studies. As a consequence after the experiment, the research is conducted to find out the mouse activities that could be use in the game to replace the use of drag and drop. A research suggested that the drag and drop can be replaced by click-move-click activities [25]. With click-move-click activity, the children can just simply click to drag and move the picture to the position that they want then just click again to drop the picture on the spot.

4.3 SYSTEM INTERFACE, LESSON AND GAME SCREEN SHOTS

The system interface was designed using the Adobe Dreamweaver CS3 and Adobe Flash CS3. The following figures show the interface's screen shots of the website developed.

4.3.1 Login and Registration Page for Children

As mentioned previously that there children and teacher will have different pages to log in, Figure 4.3 shows the children's login and registration page.



Figure 4.3 Children login (a) and Registration (b) page

The student can login with their username and password in the orange box which also contain the link for teacher login page. In this page, there is a flash animation of a Thai preschool student introducing the website and instruction to the users and visitors.

This page allows students to choose the module of the lesson and game according to their preferences. The modules are represented by the picture buttons with the rollover sound thus when students roll the cursor over the picture they will know what are the content of that particular module. Figure 4.4 shows the main module selection page.



Figure 4.4 Module Selection Page

Thai alphabets lesson introduces the children to read each 44 alphabets. The children will learn how to pronounce and memorize the alphabet by relating that particular alphabet with a vocabulary that starts with that alphabet e.g. the example of “A -ant” in English. As a result, besides knowing how to read the alphabets, they also learn some new vocabularies.



Figure 4.5 Thai Alphabet Lesson

The lesson of this module available in two options i.e. runs manually and automatically. With runs manually mode, figure 4.5, the students can click for play and replay thus students can control their own pace of learning.

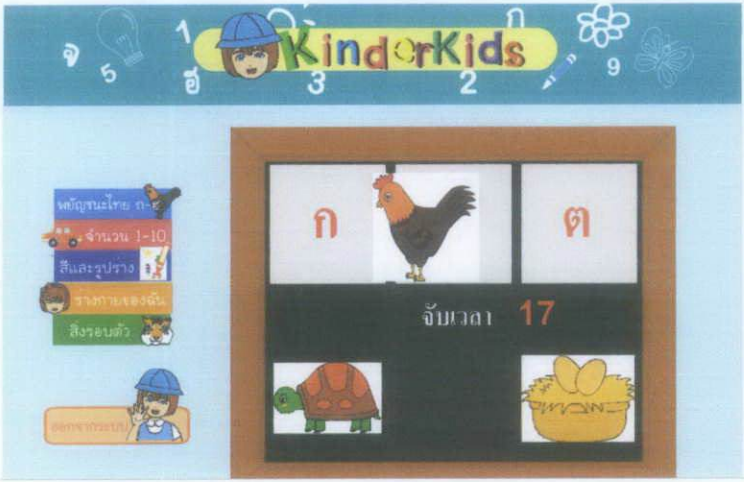


Figure 4.6 Thai Alphabet Game

Figure 4.6 shows Thai Alphabet game. Thai Alphabets game will actually test the children by asking them to match the 24 pictures with the 24 important alphabets. In order to complete this game, the children have to know how to call each thing and thus knowing that it starts with what alphabet.

4.3.4 Number Module

Numeracy is another important lesson. The lesson will teach children to count from one to ten which is the basic level that they should know for the first year of the preschool level.



Figure 4.7 Number Lesson

As shown in figure 4.7, Arabic numerals are officially used in the school. However, Thai numerals also being taught and all students are required to know how to write them too.



Figure 4.8 Number Game

Numbers game shows in figure 4.8, tests the children on counting. This game is basically the connecting dots game whereby the numbers show beside the dots. The children must be able to count from one to ten in order to click and complete the line to see what is hiding inside the pictures.

4.3.5 Colors and Shapes Module

In colours and shapes lessons, the children will learn how to call and differentiate the different colours and shapes. Accompanying with the animation which shows where they can see each colour and shape in their daily live.



Figure 4.9 Colours lesson (a) and Shapes lesson (b)

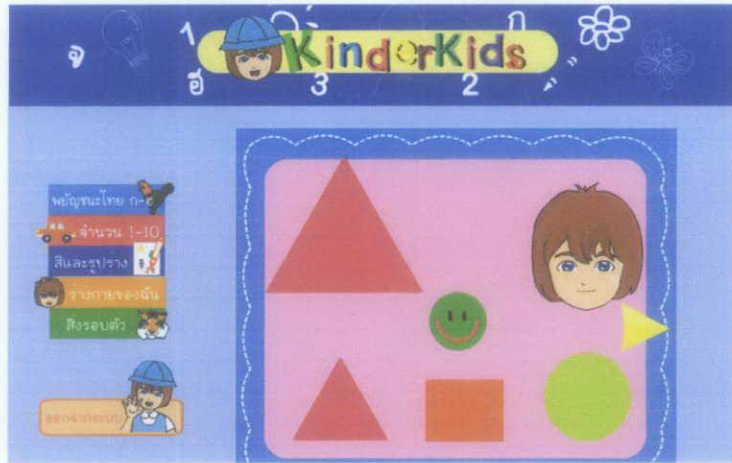


Figure 4.10 Colours and Shapes Game

Colours and Shapes game will assure that the children know the basic colours and shapes that they used to see. In this game children learn and memorize by finding the shapes and colours according to the instruction given by the animation shows in figure 4.10.

4.3.6 Myself and Family Module

Under myself and my family, the lesson will be separated into two mini-lessons shows in figure 4.11 (a) and (b). Myself lesson will teach the children about the parts of body while the family lessons will teach them how to call each family member.



(a)



(b)

Figure 4.11 Myself (a) and Family Lesson (b)



Figure 4.12 Myself Game

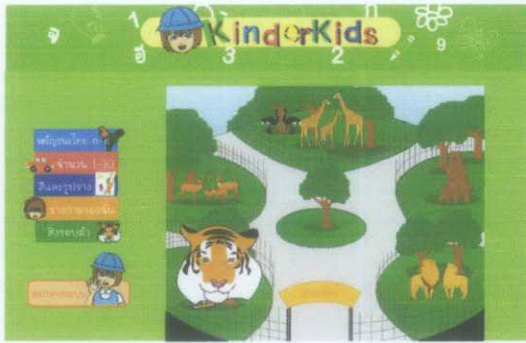
The game of this module focuses on body's parts. The objective of the game is basically to teach the children new vocabularies the utensils and things that they use and may see in daily life. The children will have to match the body's part with utensils or things that use with that part e.g. brush and teeth.

4.3.7 Surrounded Environment Module

The surrounded environment includes places, living and non-living things around the children. In the lessons for this module, the animation will show the house's area of the children character together with introduce the children about the animals which at this level they should know which are pets, wild animals and some aquatic animals.

The lesson for this module is divided into four mini-lessons i.e. house, pets, wild animals and aquatic animals show in figure 4.13 (a), (b), (c) and (d) respectively.





(c)



(d)

Figure 4.13 Surrounded Environment Module

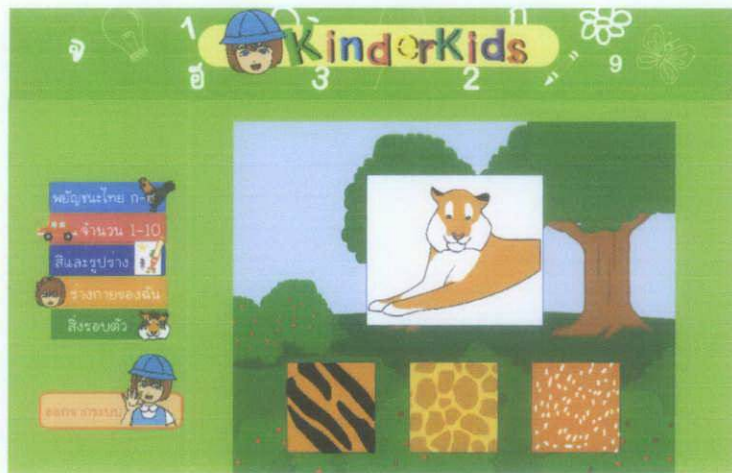


Figure 4.14 Animal's Parts Game

The game lets the children find the missing parts of the animals e.g. patterns of the zebra, the antler of the deer and the mane of the lion.

4.3.8 Login and Registration Page for Teacher



(a)



(b)

Figure 4.15 Teacher's Login (a) and Registration page (b)

Figure 4.15 (a) and (b) shows teacher’s login and registration page. The teachers will login and have different homepage.

4.3.9 Teacher’s Main Page

The page for teacher aims to display the student latest score in each module. They can make the comparison between current or latest scores and previous score the students have got and thus can see whether the students have learning progress or any improvement. The teacher’s interface is shown in figure 4.16.



Figure 4.16 Teacher’s Main page.

In addition, the students can be grouped according to their scores to see whether the scores meet the requirement of the teachers or not. As a consequence, the teacher can pay put more assistant to that particular group of children, to help them learn more Thai language and also the skills they lack.

4.4 DISCUSSION

The system has been tested with the preschoolers again after the small experiment when the system was almost completed. The system is tested by 10 preschoolers under the instructions of the teachers and the developer. Each child tested all the lessons and game modules with accompany by their friends.



Figures 4.17 System Testing

After the testing, a developer conducted a feedback collecting session. The session aimed to be a session to collect the feedback from the children regarding the usage of the website, lesson and the game since they are not able to read and write to answer the questionnaire yet. The results from the session are summarized as shown in the bar chart below.

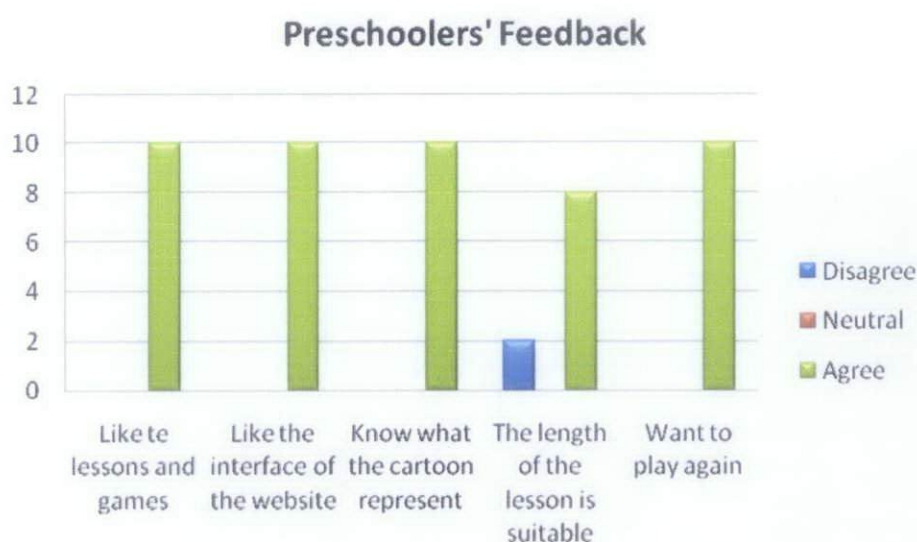


Figure 4.18 Preschoolers' feedback for the system testing

The results in the bar chart show that the preschoolers like to watch the animation lessons and also like to play the flash games as it's animated with the colourful pictures. Regarding the website, the preschoolers like the website interface as it has different colours. They know what the animation characters represented. And all of them want to play again if they have chance. The only one question that not all the children agree is whether the length of the lessons is appropriate. Two of the children feel that the lessons are too short and they want to watch more lessons.

Apart from the children's feedback, the teachers as the observers of the testing are to give the feedback regarding the lessons and the game too.

As show in Figure 4.18 the teachers are asked to evaluate the attention and interest of the children towards the alternative learning game. The result of the evaluation of the teachers show that the children are interested in and paid a lot of attention towards the lessons and games as the evidence in figure 4.18 whereby all most all of the children in the class both first and second year of the preschool level were standing and sitting in front of the testing laptop. The content of the lesson and the game were evaluated again even though they are designed with their intensive involvement.

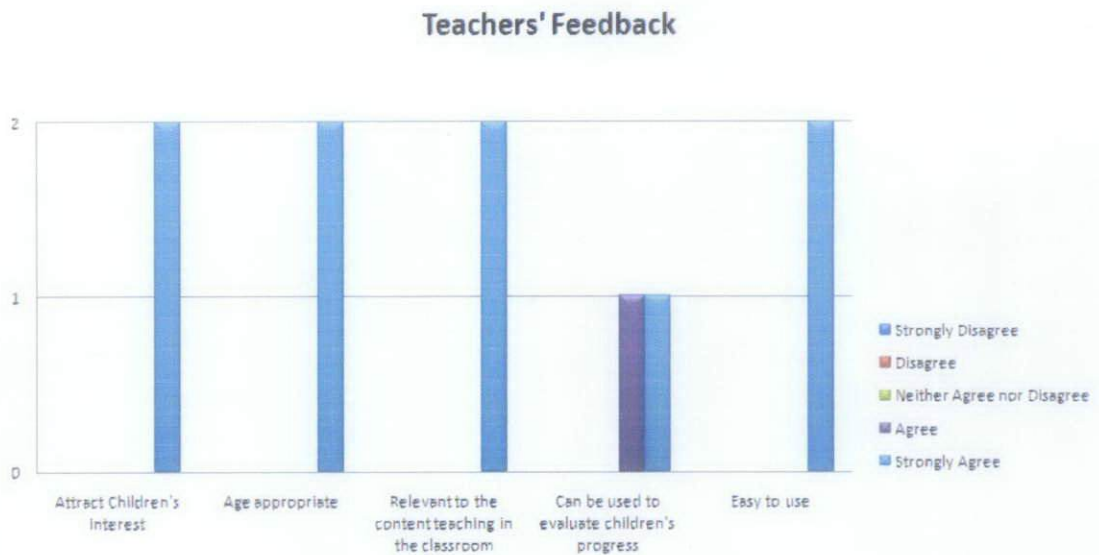


Figure 4.19 Teachers' feedback for the system testing

The evaluation of the teachers showing that from the teachers' perspective the alternative learning game can attract children's interest, age appropriate, relevant to the content teaching in the classroom thus they can really apply it as an alternative of the traditional games. The children's progress are also can be evaluated using this system since it has the function for the teacher to track the children score of the each game they play. The ease of use are rated highly though for the first time the children might face some difficulties in holding the mouse and clicking, but after playing for a while they start to get used to it. Thus the teachers believed that if they have chance to play it more often they will be able to use computer better and faster.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

After a semester of researching on the children and their development with regarding the use of computer and online games, many studies show the benefits of using this kind of games including attracting children attention better than some traditional game, engaging children to learn by doing and visualizing, eliciting social interaction and most importantly it is proved that it helps in developing the language and literacy development of the children.

The preliminary study and experiment are conducted with the prototype of the system in Baan Najuak School to gain better understanding regarding the problems exist and the preschool approach using in public Thai school. Besides the psychomotor of the children is tested to ensure the games are match with their abilities.

The prototype system is also tested with 10 preschoolers in Baan Najuak School under the instruction of the developer and teachers. The result of the testing showed the excitement of the children towards the system which is a good sign for the implementation in the real learning environment of the preschool classroom later on.

5.2 RECOMMENDATIONS

For future improvement of the system, the recommendation made by the teachers and the examiners are to add the following two functions;

- (1.) To group the students into active and non-active users
- (2.) To have more interaction in the mini-lesson

As a consequence, the teachers can easily focus on the right group of students to encourage those who are not actively play to play more thus they can learn more. And for the second recommendation, the interaction of the lesson should be added more to make the lesson more interactive to students thus they will pay more attention towards what they are learning.

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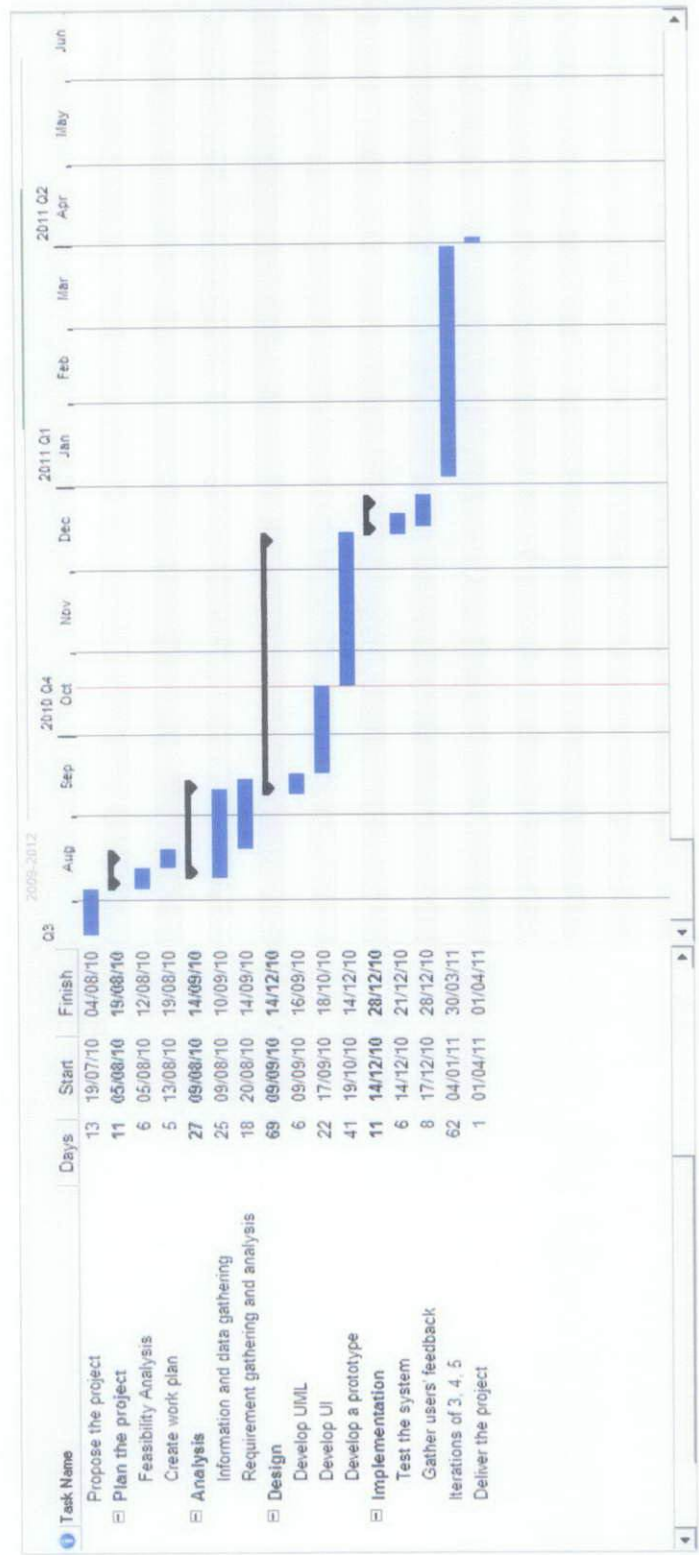
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APPENDICES

Appendix A: Project's Gantt Chart



Appendix B: System Pre-Test Survey (Original in Thai Language)

Section A : General Information

1. School Name: _____
2. Gender ☐ Male ☐ Female
3. Year of experience in teaching preschool level
☐ less than 5 years ☐ 5-10 years ☐ over 10 years

Section B: System Familiarity

1. How often you use computer/internet?
☐ Everyday
☐ More than 3 times a week
☐ Depend on the tasks
2. Please rate yourself for the familiarity with computer and internet.
☐ High ☐ Moderate ☐ Low
3. How often you use flash games in class activity?
☐ Never ☐ Rarely ☐ sometimes ☐ often
4. How do you store students score?
☐ Paper-based
☐ Using Microsoft Office tools
☐ Combination of above
5. What is your opinion in implementing the online flash games as an alternative game in class?
☐ Agree ☐ Disagree
Please state the reason:

6. Please rate your students according to the following criteria.

	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>
a. Familiarity in sing computer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Familiarity in using Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Play online or computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Other comment/suggestion

-Thank you for completing this survey-

Appendix C: System Feedback Survey (Original in Thai Language)

Section A: General Information

1. School Name: _____
2. Gender ☐ Male ☐ Female
3. Year of experience in teaching preschool level
- ☐ less than 5 years ☐ 5-10 years ☐ over 10 years

Section B: System Feedback

Please rate the following according to your opinion.

(1 = Strongly Disagree to 5 = Strongly Agree)

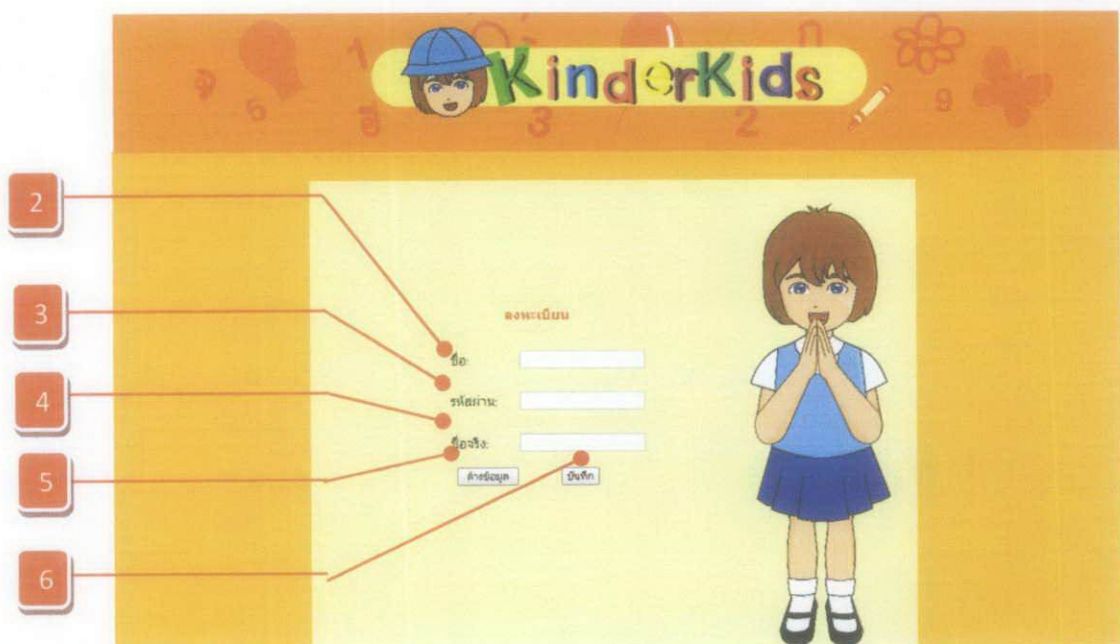
	1	2	3	4	5
1. The system is able to attract children's attention.					
2. The system is age appropriate.					
3. The system is relevant to the content teaching in the preschool.					
4. The system is can be used to evaluate children's progress.					
5. The system is easy to use					

-Thank you for completing this survey-

Appendix D: Instructor Manual

System Instruction: Children

1. Register



1. Click on the register link
2. Enter username
3. Enter password
4. Enter full name
5. Click to reset
6. Click to save


2. Login



1. Enter username
2. Enter password
3. Click on for login

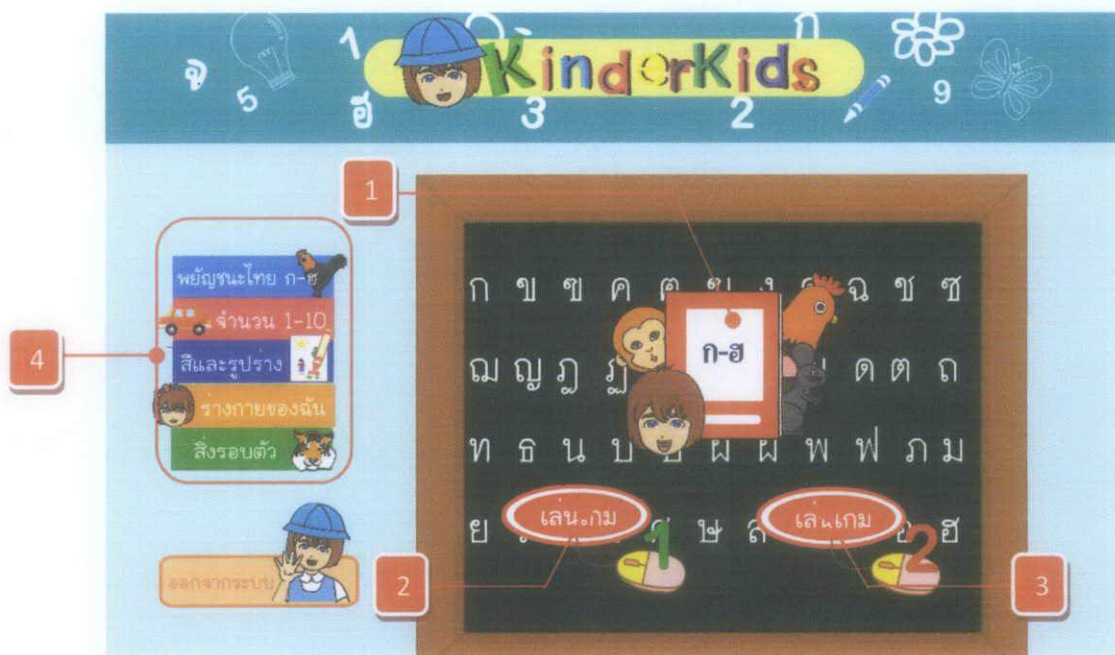
3. Lesson and Game Selection



1. Thai Alphabet Module
2. Numeracy Module
3. Myself and My Family Module
4. Surrounded Environment Module
5. Shape and Colors Module
6. Click  to logout

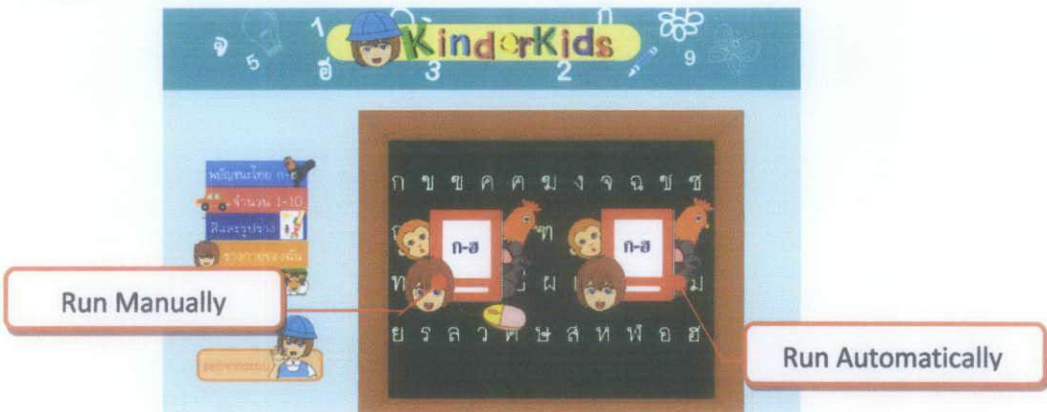
* Students can roll the mouse over the picture to listen to the module name

4. Thai Alphabet Module

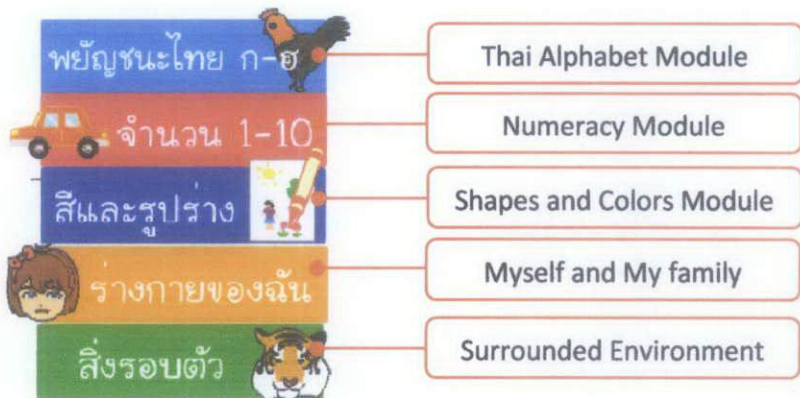


1. Lesson for Thai Alphabet

Note: there are two options for learning the lesson which are run the lesson by clicking or run it automatically



2. Play game (easy level)
3. Play game (intermediate level)
4. Option for module selection

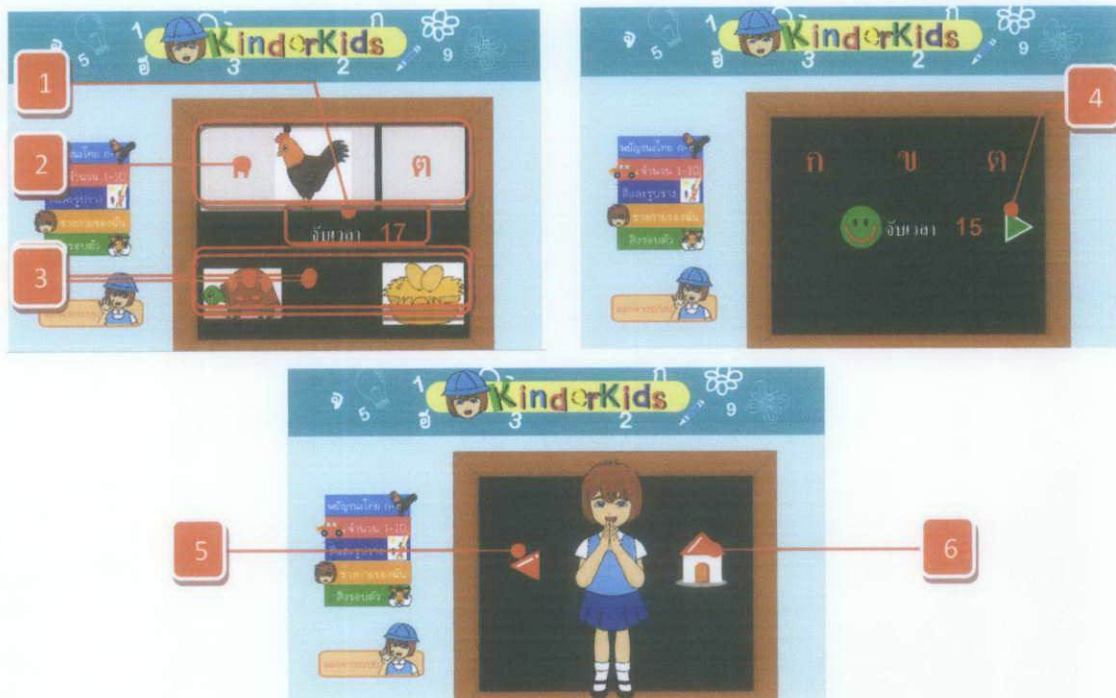


4.1 Lesson (Run Manually)



1. Replay
2. Go forward
3. Skip to choose game

4.2 Game



1. Timer: count ascending until 60 (60 seconds)
2. Placing area: contain the alphabets
3. Pictures to be picked and placed on the placing area on the relevant alphabet
Note: use the click-move-click mouse activity i.e. click the picture once then move to the particular alphabet then click again to paste
4. Click the green button to go to next stage

5. Replay
6. Go to the main module selection page

5. Numeracy



1. Number lesson
2. Play game

5.1 Lesson



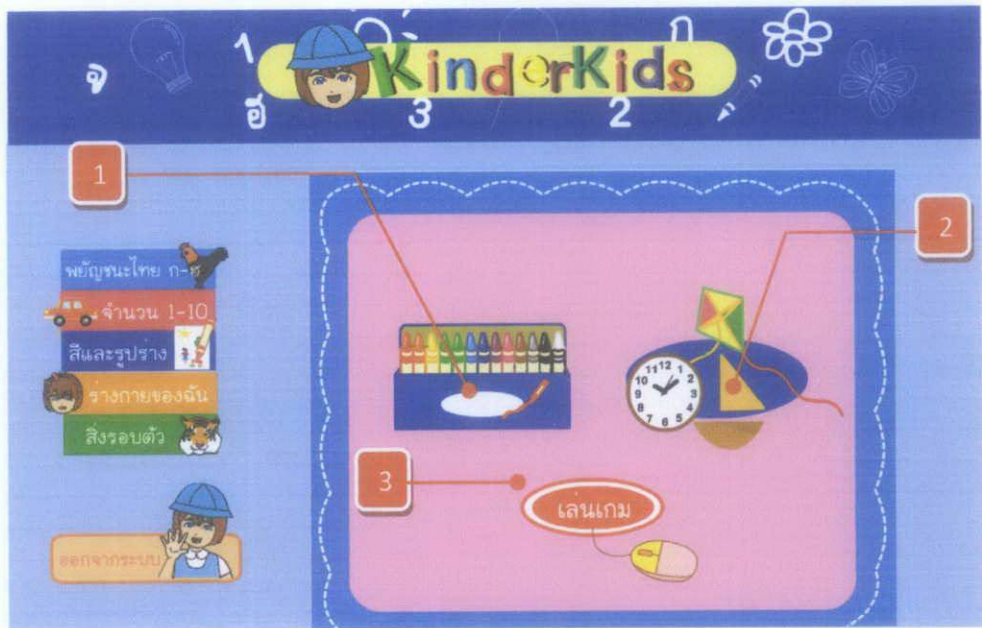
1. Arabic Number
2. Thai Number

5.2 Game



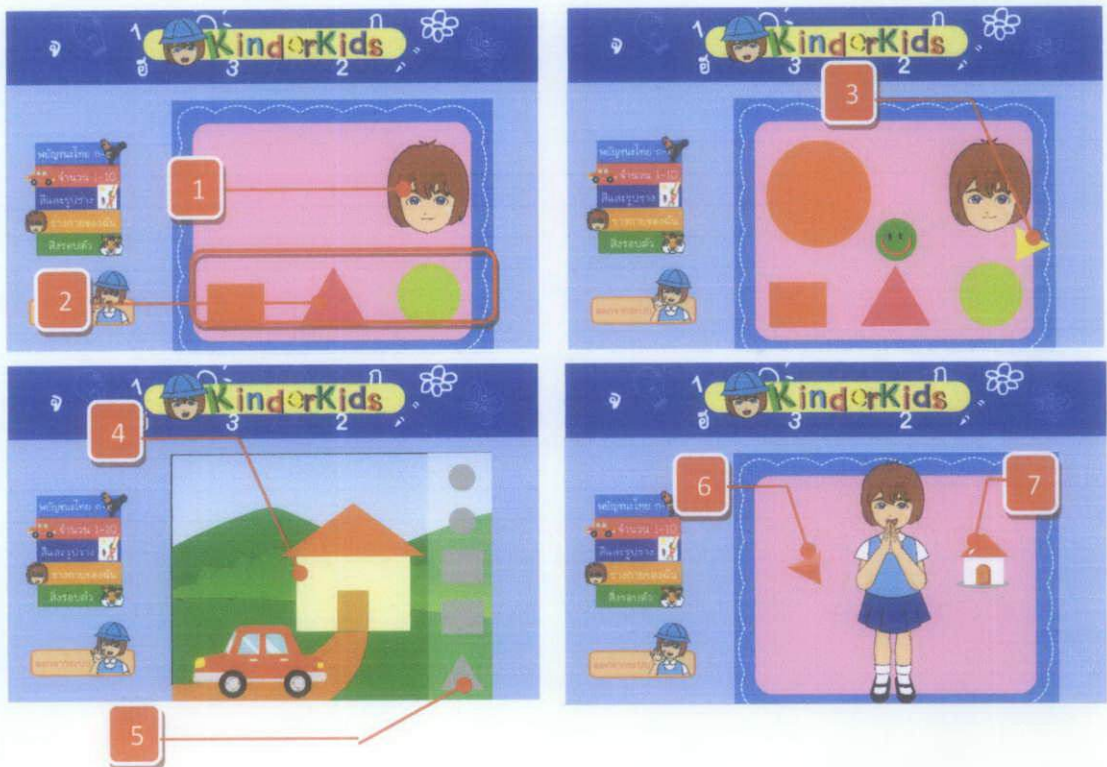
1. Click on the back spot according to the sequence of the number
2. Click on the yellow button to go to next stage
3. Replay
4. Go to the main module selection page

6. Shapes and Colors



1. Colors lesson
2. Shapes lesson
3. Play Game

6.1 Game



1. The character will give instruction on which of the shapes or colored shapes to be clicked by the students
2. Options to be clicked
3. Click on the yellow button to go to next stage
4. Last stage of the game, the students have to search for shapes they see in the picture
5. Expected shapes to be clicked
6. Replay
7. Go to the main module selection page

7. Myself and My family



1. My Family lesson
2. Myself Lesson
3. Play game

7.1 Game



1. Placing area: shows the body's parts
2. Utensils to be matched with the relevant parts
Note: use the click-move-click mouse activity i.e. click the picture once then move to the particular alphabet then click again to paste
3. Click on the green button to go to next stage
4. Replay
5. Go to the main module selection page

8. Surrounded Environment



1. House
2. Pets
3. Aquatics
4. Wild Animals
5. Play Game

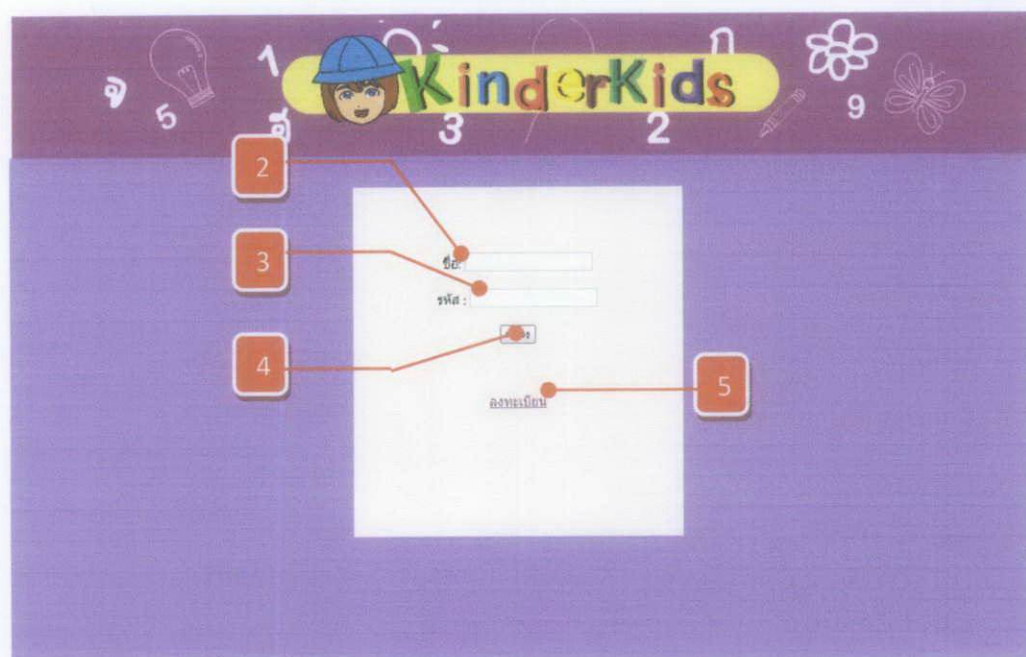
8.1 Game



1. Animal that missing its pattern (a part of body)
2. Option to be clicked by the student to match with the picture of animal showing
3. Click yellow button to got to next stage
4. Replay
5. Go to the main module selection page

System Instruction: Teacher

1. Login



1. Click on the link to go to login page
2. Enter username
3. Enter password
4. Click to login
5. Click on the link for registration

2. Registration

The registration form is titled "ลงทะเบียน" (Register) and is located on a yellow background. It features a cartoon girl on the right. The form fields and buttons are as follows:

- 1. Username field (labeled "ชื่อ")
- 2. Password field (labeled "รหัสผ่าน")
- 3. Full name field (labeled "ชื่อจริง")
- 4. "ล้างข้อมูล" (Reset) button
- 5. "บันทึก" (Save) button

1. Enter username
2. Enter password
3. Enter full name
4. Click to reset
5. Click to save

3. Teacher's functions

The screenshot shows the KinderKids teacher interface. At the top, there is a header with the KinderKids logo and decorative elements. Below the header, there is a navigation bar with tabs for 'รายชื่อนักเรียน', 'รายชื่อนักเรียน', 'จำนวน', 'ติดตามนักเรียน', 'นักเรียน', and 'ติดตามนักเรียน'. The main content area displays a table of student scores. On the left side, there is a sidebar with a list of functions, each with a corresponding numbered callout. The sidebar functions are: 'คะแนนเกมต่างๆ', 'เกม คะแนนเพิ่ม', 'เกม คะแนนลด', 'เกม คะแนนต่ำกว่าเกณฑ์', 'ข้อมูลนักเรียน', and 'ออกจากระบบ'. The table shows the following data:

id	username	last_visit	current_score	previous_score
1	put	2011-04-26	12	11
2	natty	2011-04-10	12	10
3	Asia	2011-04-10	10	9
4	ynee	2011-04-11	8	8

1. Overall score
2. List of students who have improvement on their scores
3. List of students whose scores decreased from previous attempt
4. List of students who have scores under the requirement
5. Students' information
6. Tabs for selecting the module
7. Table shows the username, last visit, current and previous score of each students
8. Log out